EPA's National Fish Tissue Study: Evaluating the Nation's Water Quality

Leanne Stahl
National Fish Tissue Study Manager
Office of Water/Office of Science & Technology (4305T)
(202) 566-0404
stahl.leanne@epa.gov

Key Words: fish, contamination, United States, mercury, PCBs

The Office of Science and Technology within EPA's Office of Water is conducting the largest national freshwater fish contamination survey undertaken by the Agency, the National Study of Chemical Residues in Lake Fish Tissue (or, more simply, the National Fish Tissue Study). Two features distinguish this study from other fish monitoring programs. It includes the largest set of chemicals ever studied in lake fish, and it is the first national fish contamination survey to have sampling sites selected according to a statistical design. This study will provide the first national estimates of mean concentrations and prevalence of 268 persistent, bioaccumulative, and toxic (PBT) chemicals in fish. It will also provide a national baseline for assessing progress of pollution-control activities limiting release of these chemicals into the environment.

Partnerships made this study possible. Agencies in 47 states, three tribes, and two other federal agencies collaborated with EPA for four years to collect fish from 500 lakes and reservoirs in the lower 48 states. Sampling teams applied consistent methods nationwide to obtain samples of predator and bottom-dwelling species from each lake. EPA is analyzing the fish tissue for mercury, arsenic, dioxins and furans, PCBs, pesticides, and other organic chemicals, such as phenols. EPA plans to complete chemical analysis of the fish in 2004.

Results for the first three years of the study show that mercury and PCBs were detected in predator species at all 361 sites sampled, while dioxins and furans were detected in predators at about 80% of these sites. Several chemicals have not been detected in the fish samples, including organophosphate pesticides and other organic chemicals, such as hexachlorobenzene.
EPA will begin analysis of fish study data when the cumulative, four-year analytical data set is available in November 2004. Core components of the statistical analysis will include the following: estimates of national means for chemical concentrations in fish by composite type (i.e., predator or bottom dweller); cumulative frequency distributions for chemicals by composite types; national maps of chemicals by composite type for mercury, PCBs, and dioxins/furans; analysis of various sample factors, such as number of fish in the composite, size effects, and species effects; and estimates of sampling variability based on replicate sample data. EPA will complete data analysis during 2005 and produce the final study report in Spring 2006.